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The International Conference on Strongly Coupled Coulomb Systems meeting, by all accounts, was quite successful. The number of Participants was 157 from 23 countries, including, in addition to the U.S., Canada and Western Europe, Yugoslavia, Russia, Ukraine, Kazakhstan, Korea, Japan, China, India, and Australia. The interdisciplinary aspect of the Conference was much appreciated by most participants and it was generally agreed that the Conference had broken new ground by involving groups from contiguous areas and by creating a bridge between plasma physics and areas of condensed matter physics.

The Proceedings of the Conference will be published by Plenum Press.

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conference, 23 countries, 157 participants

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International Conference on
Strongly Coupled Coulomb Systems

SCCS 97

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Boston College, August 1997

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International Conference
on Strongly Coupled Coulomb Systems

Conference Program

Boston College 1997

Sunday, August 3

Welcome Reception **7:00 - 9:00**

Monday, August 4

Opening **9:00** **G. J. Kalman**

Michael Smyer **Welcoming Address**
Associate Vice President for Research and Dean, Graduate School of Arts and Sciences, Boston College

Marie Mc Hugh **Welcoming Address**
Senior Associate Dean, College of Arts and Sciences, Boston College

Session 1A **9:15** **I. L. Iosilevski**

IONIC LIQUIDS

N. March	*40'*	**Liquid metals: Electronic correlations**
E. Burkel	*20'*	Dynamical structure factor of liquid metals measured by inelastic X-ray spectroscopy
M.-L. Saboungi	*20'*	Structure and transport in molten salts and liquid semiconductors

Session 1B **11:00** **W.-D. Kraeft**

J. Chihara	*20'*	Change from liquid metal to plasma *(Chihara, Kahl)*
I. L. Iosilevski	*15'*	Anomalous phase diagram in simplest plasma model *(Gryaznov, Iosilevski, Yakubov)*
E. Marceca	*20'*	Thermodynamic properties and local structure of He-Hg mixtures from near-critical conditions to high temperature and pressure *(Marceca, Hensel)*
W.-C. Pilgrim	*15'*	The monoatomic-molecular transition in expanded alkali metals *(Pilgrim, Ross, Yang, Hensel)*
V. Kozhevnikov	*15'*	Phase transition in sub and super critical mercury fluid
I. L. Iosilevski	*Poster*	Ionic model for liquid uranium dioxide *(Iosilevski, Chigvintsev)*
V. Ya. Ternovoi	*Poster*	Investigation of tin thermodynamics in near critical point region *(Ternovoi, Filimonov, Fortov, Lomonosov, Nikolaev, Pyalling)*

Session 1C 2:00 H. Gould

MULTICOMPONENT AND ASTROPHYSICAL PLASMAS

H. DeWitt	40'	**Equation of state and phase diagram for binary ionic plasma** *(DeWitt, Slattery)*
H. S. Kang	20'	Thermodynamic and structural properties of strongly coupled plasma mixtures from the perturbative HNC-equation *(Kang, Ree)*
A. Mirone	15'	Statistical mechanics of highly charged ions in NLTE plasmas *(Faussurier, Mirone, Gilleron, Gauthier)*
T. Kahlbaum	Poster	Advances in the calculation of the free energy virial expansion for multi-component quantum plasmas up to the third order in the density

Session 1D 4:00 Y. Rosenfeld

DUSTY PLASMAS I

V. E. Fortov	40'	**Phase Transition in Dusty Plasmas Experiments** *(Fortov, Nefedov, Torchinski, Molotkov, Khrapak, Petrov)*

WHITE DWARFS

J. Isern	20'	Crystallizing white dwarfs
D. G. Yakovlev	20'	Cooling of neutron stars as a probe of strongly coupled coulomb plasma in their envelopes *(Yakovlev, Chabrier, Potekhin)*
G. Shaviv	15'	The screening of nuclear reactions in astrophysical plasmas *(Shaviv, Shaviv)*
V. Rantsev-Kartinov	Poster	Effect of dynamical screening of charged particles in Maxwellian plasmas on the criterion of plasma non-ideality *(Krainov, Rantsev-Kartinov, Trofimovich)*
D. K. Geller	Poster	Coulomb collisions in strong magnetic fields *(Geller, Weisheit)*
W. Stolzmann	Poster	The effects of exchange and correlation for astrophysical relevant quantities *(Stolzmann, Blöcker)*

Session 1E 8:00 R. K. Pathak

POSTER SESSION

see the separate poster directory distributed on Monday

Tuesday, August 5

Session 2A 9:00 G. Senatore

DENSITY FUNCTIONAL THEORY

W. Kohn	40'	**Density functional theory in 1997**
Ch. Dharma-wardana	20'	Density functional calculations for (I) K-shell absorption edge and (II) energy-relaxation in dense plasmas
O. G. Heinonen	20'	Ensemble density functional approach to inhomogeneous quantum hall systems
R. Martin	20'	Linear scaling methods in density functional theory
J. Perdew	20'	Local and semilocal density functional approximations: Why do they work?
D. C. Wang	Poster	Density functional theory of freezing: application of the weighted density approximation *(Wang, Gast)*
G. Faussurier	Poster	Average-atom model and density functional theory using functional integrals

Session 2B 11:30 H. Totsuji

EQUATION OF STATE

F. J. Rogers	40'	**Equation of state of partially ionized plasmas**
A. Likalter	20'	Disordered systems with a virtual atomic structure
Y. Rosenfeld	20'	Dimensional cross-over, close-packed configurations, symmetry-breaking, and the freezing transition in density functional theory

Session 2C 2:00 D. Kremp

A. DeSilva	20'	Measurements of electrical conductivity in strongly coupled metal plasmas *(DeSilva, Katsouros)*
J. Benage	15'	Measuring the EOS of a dense, strongly coupled plasma; description of the technique and preliminary results *(Benage, Kyrala, Workman, Tierney IV)*
K. J. LaGattuta	15'	New computational technique simulates atomic scale phenomena in dense materials
W. Däppen	20'	The sun – strong constraints on a weakly coupled plasma

Session 2D 3:40 W. Ebeling

HYDROGEN I

W. J. Nellis	*40'*	**The metallization of fluid hydrogen**
W. R. Magro	*20'*	RPIMC calculations in hot, dense hydrogen *(Magro, Militzer, Ceperley, Pierleoni, Bernu)*
C. Toepffer	*20'*	Wave packet molecular dynamics (WPMD) simulation of hydrogen under extreme conditions
F. B. Baimbetow	*15'*	Scattering cross sections and conductivity of strongly coupled hydrogen plasma *(Nurekenov, Baimbetov, Gabdullina, Redmer, Röpke)*
B. Militzer	*Poster*	Fermionic path integral simulations of dense hydrogen *(Militzer, Ceperley)*
T. S. Ramazanov	*Poster*	Correlation functions and the equation of the state of a strongly coupled hydrogen plasma in HNC approximation *(Ramazanov, Baimbetov, Bekenov, Nagel, Redmer, Röpke)*
F. B. Baimbetow	*Poster*	Monte Carlo simulation of the equilibrium properties of a strongly coupled hydrogen plasma *(Baimbetow, Bekenov, Ramazanov, Itzeleuov)*

Session 2E 8:00 P. P. J. M. Schram

SPECTROSCOPY

R. W. Lee	*40'*	**Perspectives on plasma spectroscopy in dense plasmas**
A. V. Demura	*15'*	MD radiation redistribution functions of multiply charged ions in dense plasmas *(Demura, Bulyshev, Lisitsa, Starostin, Suvorov, Yakunin)*
D. Gilles	*15'*	On plasma statistics of microfield gradients and line asymmetries *(Gilles, Demura, Stehle)*
C. F. Hooper	*15'*	Theoretical analysis of x-ray spectra obtained from recent laser-driven implosion experiments *(Hooper, Haynes, Junkel, Gunderson, Bradley, Delettrez, Jaanimagi, Woolsey, Lee, Mancini)*
A. V. Demura	*Poster*	Radiation redistribution functions of Helium-like, multiply-charged ions in model microfield method *(Demura, Feautrier, Kosarev, Lisitsa, Stehle)*
V. E. Fortov	*Poster*	Discrete Spectra in Strongly Coupled Plasma *(Fortov, Filimonov, Griaznov, Kvitov, Kulish, Mintsev, Nikolaev, Pyalling, Ternovoi)*
Yu. Kurilenkov	*Poster*	The correlation effect in spectra of dense hydrogen plasma *(Gavrilova, Averyanov, Vitel, Le Guen, D'yachkov, Kurilenkov)*
D. N. Nikolaev	*Poster*	Time resolved optical spectroscopy of a lead in the near critical point states *(Nikolaev, Filimonov, Fortov, Gryaznov, Kvitov, Pyalling, Ternovoi, Hoffmann, Stöckl, Dornik)*

Wednesday, August 6

Session 3A 9:00 P. Reynolds

ELECTROLYTES, COLLOIDAL SUSPENSION

M. E. Fisher	*40'*	**Density correlations and charge oscillations from the generalized Debye-Hückel theory** *(Fisher, Lee, Bekiranov)*
L. Blum	*20'*	Scaling in charged fluids: a variational form of the mean spherical approximation
H. Iyetomi	*15'*	Electronic properties and mechanism of superionic conductivity in solid electrolytes *(Iyetomi, Kikuchi, Hasegawa)*
U. Mohanty	*15'*	Polarization of counterions in polyelectrolytes

Session 3B 11:00 U. Mohanty

A. P. Gast	*40'*	**Crystallization of soft spherical particles: generalities and open questions from colloidal suspensions**
E. J. Amis	*20'*	Polyelectrolyte solutions: structure and dynamics from strong interactions
P. P. J. M. Schram	*15'*	Theory of colloidal plasmas *(Trigger, Schram)*
M. E. Fisher	*Poster*	Critique of primitive model electrolyte theories using thermodynamic bounds *(Fisher, Lee, Zuckerman)*
G. A. Pavlov	*Poster*	Instability of front edge of non-Newtonian polymer suspension film *(Pavlov, Baturin, Shiryaev)*

Session 3C	2:00	D. Dubin - *Session dedicated to the memory of John. H. Malmberg*

CHARGED PARTICLE TRAPS, NON-NEUTRAL PLASMAS

J. P. Schiffer	*40'*	**Ordering phenomena in cold Coulombic systems**
B. Franzke	*20'*	Anomalous low temperature of electron cooled ion beams in the ESR
R. Grimm	*20'*	Laser-cooled ion beams in the storage ring TSR *(Grimm, Grieser, Lauer, Luger, Miesner, Peters, Schramm, Schwalm, Stößel)*
J. S. Hangst	*20'*	Results from the ASTRID storage ring

Session 3D	4:00	F. Cornu

P. Huang	*20'*	Formation and control of laser-cooled, pure-ion Coulomb crystals in a penning trap *(Huang, Bollinger, Tan, Itano, Jelenkovic, Mitchell, Wineland)*
D. H. E. Dubin	*20'*	Collisional transport in non-neutral plasmas *(Dubin, O'Neil)*
K. S. Fine	*20'*	2D vortex crystals *(Fine, Cass, Driscoll)*

No Evening Event

Thursday, August 7

Session 4A **9:00** **M. Tosi** - *Session dedicated to the memory of Kundan S. Singwi*

ELECTRON LIQUID

A. K. Rajagopal	*40'*	**Electron correlations in coulomb systems in 3 and 2-dimensions: An overview**
W. Ebeling	*20'*	Quasi-classical theory and simulations of quantum plasmas including bound states *(Ebeling, Militzer, Schautz)*
A. Gold	*20'*	Screened interaction potential in the three and two-dimensional electron gas: bound states induced by many-body effects *(Gold, Ghazali)*
M. H. Lee	*15'*	Static and dynamic properties of an electron gas at r_s=3.5

Session 4B **11:00** **K. Bedell**

K. N. Pathak	*20'*	Structure and dynamics of two dimensional quantum fluids *(Pathak, Moudgil)*
R. K. Pathak	*20'*	Rigorous bounds to coulomb energy functionals
Sh. Shapira	*20'*	Strongly interacting 2D fermion layer – a quantum to classical crossover experiment
M. Tosi	*20'*	Two-pair excitations and dynamic exchange-correlation potentials in the electron gas *(Conti, Nifosi, Tosi)*
V. S. Filinov	*15'*	Wigner approach and generalization molecular dynamics method in quantum theory of strongly coupled systems of particles
M. Steinberg	*Poster*	Equilibrium properties of weakly coupled magnetized systems *(Steinberg, Ortner, Ebeling)*
I. Tkachenko	*Poster*	Modeling of the electronic static local field correction *(Tkachenko, de Cordoba, Belda)*

Session 4C	2:00	K. N. Pathak

HUBBARD MODEL

K. Bedell	*40'*	**The electron gas and the Hubbard model: The long and short of it**
E. Tsiper	*20'*	Quantum melting on a lattice and a delocalization transition *(Efros, Tsiper)*
D. Khveshchenko	*15'*	Compressible states of electrons in strong magnetic fields: A genuine example of a 2D non-fermi-liquid
K. B. Blagoev	*Poster*	Metal-insulator transition in ferromagnetic metals *(Blagoev, Bedell, Engelbrecht)*

Session 4D	3:40	G. Röpke

QUARK-GLUON PLASMAS

M. Le Bellac	*40'*	**Collective excitations in the quark-gluon plasma**

QUANTUM DOTS

R. Berkovits	*20'*	Transport through low density quantum dots
P. Hawrylak	*20'*	Electronic correlations in semiconductor quantum dots
P. Bakshi	*15'*	Collective vs. single particle response of quantum dot ensembles *(Bakshi, Kempa)*
M.-E. Pistol	*15'*	Optical studies of individual InAs quantum dots *(Landin, Miller, Pistol, Pryor, Samuelson)*

Reception and Concert	8:00

Friday, August 8

Session 5A 9:00 J. Dufty

BILAYERS

J. Nicholls	*20'*	Correlation effects on the coupled plasmon modes of a double quantum well
F. Peeters	*20'*	Classical atomic bilayers *(Peeters, Partoens, Schweigert, Schweigert, Goldoni)*
G. Senatore	*20'*	Recent progress on the phase diagram of coupled electron layers in zero magnetic field
L. Swierkowski	*20'*	Coulomb drag and exciton condensate in coupled electron hole layers
V. Valtchinov	*15'*	Structure and dynamics of electronic bilayer liquids *(Valtchinov, Kalman, Golden)*

Session 5B 11:00 Yu. Kurilenkov

FUSION PLASMAS

C. Deutsch	*40'*	**Hohlraum targets driven by cluster ion beams for inertial confinement fusion** *(Deutsch, Tahir, Geb, Maruhn)*
M. Stetter	*15'*	High density plasma physics with heavy ion beams *(Stetter, Bock, Dornik, Funk, Geissel, Jöckl, Roth, Spiller, Stöckl, Süfl, Stöwe, Fortov, Mintsev, Kulish, Shutov, Sharkov, Golubev, Bruynetkin, Hoffmann, Tahir)*
D. O. Gericke	*15'*	Kinetic approach to the stopping power *(Gericke, Schlanges, Kraeft, Bornath)*
M. Stetter	*Poster*	Improvement of the plasma lens and new heavy ion target designs *(Stetter, Bock, Funk, Geissel, Stöwe, de Magistris, Fortov, Mintsev, Shutov, Hoffmann, Tahir)*
C. Cereceda	*Poster*	Distribution function of charged particles in a plasma of fusion interest *(de Peretti, Sabatier, Cereceda)*

LASER PRODUCED SEMICONDUCTOR PLASMAS

M. Bonitz	*20'*	Ultrafast relaxation in strongly coupled coulomb systems *(Bonitz, Kremp)*

Session 5C **2:00** **P. Bakshi**

DENSE PLASMAS

Yu. Kurilenkov	*20'*	**On dense plasmas absorbing power under weak and strong coupling** *(Kurilenkov, Maynard, Dufty, Skowronek)*
M. M. Popovic	*15'*	**On the dependence of continuum factors on plasma parameters** *(Popovic, Djordjevic)*
V. Rantsev-Kartinov	*15'*	**Observations of charged particle dynamical screening effects and phase transition to a dense plasma in hot z-pinch plasma** *(Rantsev-Kartinov, Trofimovich)*
I. Tkachenko	*15'*	**Electrical conductivity of strongly coupled model and real plasmas** *(Tkachenko, de Cordoba)*
N. Vogel	*15'*	**Plasma focus experiments**
P. D. Gasparian	*Poster*	Comparison of average atom and collisional-radiative kinetic model in strongly coupled plasma *(Gasparian, Kotchubey, Roslov)*
V. Rantsev-Kartinov	*Poster*	Self-organization phenomena in dense plasma focus experiments *(Kukushkin, Rantsev-Kartinov, Terentiev, Cherepanov)*
V. Rantsev-Kartinov	*Poster*	Theory of thermoelectric field in LTE plasmas *(Krainov, Rantsev-Kartinov, Trofimovich)*
I. Tkachenko	*Poster*	Modeling of strong discharges in water *(Tkachenko, DeSilva, Iserte)*

WEAKLY COUPLED PLASMAS

V. Belyi	*15'*	**The kinetic equations for non-ideal spatially inhomogeneous plasmas** *(Belyi, Kukharenko, Wallenborn)*
J. R. Jasperse	*15'*	**Effect of two-particle correlations on plasma waves** *(Jasperse, Basu)*
A. Reynolds	*Poster*	Velocity-space drag and diffusion in a model two-dimensional plasma *(Reynolds, Fried, Morales)*
J. Wallenborn	*Poster*	Pair correlation function and non-linear kinetic equation for a spatially uniform polarizable non-ideal plasma *(Belyi, Kukharenko, Wallenborn)*

Session 5D **4:20** **F. B. Baimbetov**

HYDROGEN II

N. W. Ashcroft	*40'*	**Symmetry breaking in dense hydrogen**
R. Redmer	*20'*	Thermodynamics and metal-nonmetal transition in dense hydrogen plasma *(Bunker, Nagel, Redmer, Röpke)*
J. Clerouin	*15'*	The dense hydrogen plasma, a comparison between models *(Clerouin, Bernard)*

Conference Dinner **6:30**

Saturday, August 9

Session 6A 9:00 Yu. Chutov

IONIZATION AND BOUND STATES

M. Schlanges	40'	**Kinetic theory of ionization and recombination rates for dense quantum plasmas** *(Schlanges, Bornath)*
D. Kremp	20'	Bound states in dense non-equilibrium plasmas *(Kremp, Kraeft)*
M. S. Murillo	20'	Decay of atomic states in strongly coupled plasmas
A. Förster	15'	Stochastic simulation of ionization fronts in non-ideal plasmas *(Beule, Förster)*
R. Fehr	Poster	Spectral properties in dense plasmas *(Fehr, Kraeft)*
A. Förster	Poster	Plasma of capillary discharges *(Beule, Conrads, Ebeling, Förster)*
A. Förster	Poster	Adiabatic equation of state and ionization equilibrium of dense plasma *(Beule, Ebeling, Förster)*
Y.-D. Jung	Poster	Eikonal cross section for elastic electron-ion scattering in strongly coupled plasma
H. Norman	Poster	Vanishing of higher excited bound states without lowering of ionization potentials in partially ionized strongly coupled plasmas *(Kaklyugin, Norman)*
R. Prenzel	Poster	Ionization kinetics in a dense carbon plasma *(Prenzel, Bonath, Schlanges)*
A. N. Starostin	Poster	Non-exponential temperature dependence of reaction rates in non-ideal plasmas *(Aleksandrov, Starostin)*

Session 6B 11:00 K. Golden

RESPONSE FUNCTIONS

H. Norman	40'	**Response functions for electron-ion strongly coupled plasmas** *(Norman, Valuev)*
J. Ortner	15'	Dynamic structure factor of quantum plasmas: theory and molecular dynamics simulations using momentum-dependent potentials *(Ortner, Schautz, Ebeling)*
M. Rommel	15'	The quadratic response of an electron gas in one, two and three dimensions *(Rommel, Genga, Kalman)*
W. Stolzmann	15'	Thermodynamic functions of strongly coupled plasmas: Local field effects *(Stolzmann, Rösler)*

Session 6C	2:00	H. Lee	
G. Röpke	20'	Dielectric function and transport coefficients in strongly coupled plasmas	
G.A. Pavlov	15'	Optical characteristics of strongly coupled Coulomb systems	
L. G. Suttorp	15'	Statistical properties of plasmas with quantized electrodynamical interaction	
D. Lu	Poster	Extra loop in plasmon dispersion for strongly coupled Coulomb liquids	
G.A. Pavlov	Poster	Effective transport coefficients in low temperature multicomponent plasma	
I. Tkachenko	Poster	Electromagnetic modes in cold magnetized strongly coupled plasmas *(Rylyuk, Tkachenko, Ortner)*	

Session 6D	3:30	I. Oppenheim - *Session dedicated to the memory of Eugene P. Gross*	

STATISTICAL PHYSICS

J. L. Lebowitz	40'	**Fluctuations in coulomb systems and random matrix ensembles**	
F. Cornu	20'	Algebraic screening and van der Waals forces in partially ionized gases *(Cornu, Alastuey, Martin)*	
B. Jancovici	20'	Two-dimensional logarithmic interaction: A review	
J.-M. Caillol	20'	A Monte Carlo finite size study of charged hard spheres criticality *(Caillol, Levesque, Weis)*	
A. Perez	15'	Virial expansion for a classical hard sphere plasma in the low density limit	
W. Appel	Poster	Thermal photonic screening in a weakly relativistic plasma *(Appel, Alastuey)*	

No Evening Event

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